We can't walk through the forest and count all the bears that live there, and we can't fly overhead and sample an area like we might be able to do with deer or elk. So, how does the Department of Fish and Game (DFG) estimate the number of bears in California?

The number of bears harvested in a season reflects the condition of the bear population. Reductions in bear populations would make it more difficult to find bears and hence to harvest one. Year-to-year variability in the bear harvest is inevitable because of changes in weather which also affect bear harvest. For instance, an early winter makes it more difficult for hunters to kill a bear, especially hunters using dogs, because the roads become muddy and impassible and most hound hunting starts from vehicles traveling roads. Not only does nature affect the populations, but changes in regulations can artificially result in a decrease in bear harvest ending the season when a specified number of bears are reported killed.

Reported Black Bear Take in California, 1957-2001

Year	Total	Males	Females	Unkn. Sex	Tags Sold
1957	920	551	359	10	20,158
1958	653	371	280	2	23,057
1959	1,016	583	427	6	25,594
1960	925	472	442	11	28,648
1961	841	409	425	7	27,246
1962	594	322	268	4	26,607
1963	685	357	328	0	25,618
1964	670	361	307	2	27,413
1965	1,281	692	580	9	30,474
1966	1,054	608	441	5	35,424
1967	935	537	396	2	34,485
1968[a]	638	347	289	2	32,833
1969	871	482	383	6	33,800
1970	555	305	248	2	32,424
1971	559	343	214	2	24,768
1972[b]	626	373	251	2	25,089
1973	767	471	292	4	30,569
1974	632	373	256	3	30,680
1975	553	n/a	n/a	n/a	26,976
1976	486	260	223	3	26,232
1977	451	271	179	1	26,150
1978	655	412	243	0	16,745
1979	731	460	265	6	23,850
1980	592	324	268	0	27,221
1981	767	469	297	1	31,486
1982[c]	783	527	256	0	25,859
1983	601	377	222	2	14,408
1984	770	475	293	2	9,173
1985[d]	1,138	688	448	2	11,668
1986	1,040	592	428	20	9,864
1987	1,448	947	486	15	11,971
1988	1,359	829	508	22	12,561
1989[e]	0				0
1990[f]	1,187	730	444	13	8,611
1991	1,493	944	531	18	11,468
1992	1,266	775	457	34	11,970
1993	1,426	860	536	30	11,133
1994	1,607	986	609	12	12,123
1995	1,484	892	585	7	12,169
1996	1,714	978	727	9	15,000
1997	1,677	1,006	670	1	15,263
1998	1,676	940	734	2	18,000
1999	1,838	1,095	742	1	18,681
2000	1,796	1,052	738	6	20,573
2001	1,633	953	679	1	19,796

a = one bear bag limit instituted
b = 50 pound weight limit instituted
c = mandatory tag return and premolar tooth collection instituted
d = spring/summer dog pursuit season eliminated
e = no season
f = archery equipment not a legal method of take

DFG uses a statistical analysis of the age and sex class data obtained from hunter harvest information to develop an estimator of the harvest rate or the percent of the population that is killed by hunters. Accurate information for the bear take and the percentage of the population that is harvested can then be used to make an estimate of the total population size. The technique requires knowledge of the sex and age of bears harvested from the population.

This technique is based on

How many bears?

By Doug Updike

Photo © Gary Kramer

the principle that a consistent sex bias causes most of the change in the sex ratios observed as age increases in hunter-killed bears. In other words, males are killed at a higher rate than they occur in the population as a result of their larger home ranges and higher probability of being encountered by hunters. The younger age classes observed in the kill are dominated by males, while females make up a greater proportion of the older age classes. The harvest factor is the age at which the proportion of males is equal to the proportion of females. The population is estimated by multiplying the total harvest by the harvest factor.

In California, this estimator has been found to produce highly variable results based on very small changes in age cohorts. In 2000, the population was estimated to be 31,000, which is an increase compared to 22,000 in 1999. While there is always a need to be cautious about concluding that the bear population has increased by 40 percent in one year, there are certainly many indications that there are more bears in California now compared to 10 or 20 years ago. In the early 1980s the statewide bear population was estimated to be less than 10,000 animals. During the past 20 years, the number of bears has more than doubled.

DFG photo by staff

Doug Updike is a senior wildlife biologist specializing in bears and wild pigs.